REMARKS

The Office action has been carefully considered. The Office action rejected claims 1-41 under 35 U.S.C. § 102(e) as being anticipated by Ravikanth, U.S. Patent No. 6,327,274 (hereinafter "Ravikanth").

By present amendment, claims 1, 19, 29, 35, and 39 have been amended for clarification and not in view of the prior art. Applicants submit that the claims as filed were patentable over the prior art of record, and that the amendments herein are for purposes of clarifying the claims and/or for expediting allowance of the claims and not for reasons related to patentability. Reconsideration is respectfully requested.

Further, in the most recent Office action response prior to this Office action response, applicants amended misnumbered claims 40-42 to be accurately numbered as claims 39-41. However, the Office action still refers to these claims as 40-42. In this Office action response, applicants refer to these claims by 39-41 as amended in the last Office action response.

Applicants thank the Examiner for the interview held (by telephone) on April 9, 2004. During the interview, the Examiner and applicants' attorney discussed the claims with respect to the prior art. The essence of applicants' position is incorporated in the remarks below.

Prior to discussing reasons why applicants believe that the claims in this application are clearly allowable in view of the teachings of the cited and applied references, a brief description of the present invention is presented.

The present invention is directed to a method and system for measuring the latency of a network between transmitted packets from a sending computer to a receiving computer. The term latency is used widely in the industry and is defined as the actual amount of time between when each selected packet is sent and when each selected packet is received. Generally, latency only measures the amount of time that the packets take to get from the final transmission process in a sending computer system to the first receiving process in the receiving computer. That is, other factors, such as queue time and checksum calculations, are not included in determining latency. Thus, in any system for measuring latency, it is important to determine the exact time (via a timestamp) that a packet departs the transmitting computer and the exact time (via a second timestamp) that the packet is received at the receiving computer. Additionally, other factors are typically accounted for in the measurement, such as clock skew (the amount that one clock is faster than the other between the sending computer and the receiving computer) and lack of clock synchronization (the fact that each computer's clock may not be set to the same time.)

Embodiments of the present invention are directed to a method and a system for transmitting a group of packets from a sender to a receiver, wherein each packet is associated with a sender-relative timestamp and a receiver-relative timestamp. Based on these two timestamps, the network latency is calculated (taking into account other factors such as clock skew and lack of synchronization) and then associated with each packet. The latency is specifically defined as the amount of time elapsed between when each selected packet is sent form a first

computer system and when each selected packet is received at a second computer system. Note that the above description is for example and informational purposes only, and should not be used to interpret the claims, which are discussed below.

Turning to the claims, amended claim 1 recites a method for obtaining information for packets transmitted over a network. The method comprises transmitting a plurality of packets from a sender to a receiver, including at least one selected packet, associating a sender-relative timestamp with each selected packet transmitted, receiving at least some of the plurality of packets, associating a receiver-relative timestamp with each selected packet received, and associating a latency relative to the actual time between when each selected packet is sent and when each selected packet is received that is based on the sender-relative timestamp and the receiver-relative timestamp associated with each selected packet received.

The Office action rejected claim 1 as being anticipated by Ravikanth. Specifically, the Office action contends that column 2, lines 5-60 and column 4, lines 1-10 discloses the method recited in claim 1. Applicants respectfully disagree.

The cited and applied reference teaches, generally, a method for determining a skew rate between a source node clock and a receiver node clock. See column 3, lines 22-25 of Ravikanth. Although Ravikanth may generally teach transmitting a plurality of packets from a sender to a receiver, associating a sender-relative timestamp with the packets, and associating a receiver-related timestamp

with the packet, Ravikanth however does not teach or even suggest associating a latency, as recited in amended claim 1, with each selected packet.

Ravikanth instead teaches a method to determine clock skew between two computers in a network. In this method, the two clocks are first synchronized in order to eliminate clock offset. See column 4, lines 51-64 of Ravikanth. Then packets are transmitted from the sender to the receiver. See column 4, lines 65 to column 5, line 3. Each packet is timestamped at the sender and at the receiver so as to provide a relative time of transmission and receiving. Then, because the clocks were initially synchronized, (or at the very least, the offset was known before), the clock skew can be calculated by the drift in the transmission timestamp and the receiver timestamp through an averaging calculation. See column 5, lines 9-64. It is necessarily assumed that the network latency is constant and in fact, Ravikanth specifically recites that the measured delay coincides with the actual delay if and only if the clocks are synchronized. See column 4, lines 47-50.

Furthermore, the true latency of the network is not able to be determined because other factors, such as queue time and the skew rate itself, are not factored out of the calculation. That is, Ravikanth may teach a method for determining the skew rate between two computers, but not the network latency. Calculating latency and calculating skew rate based on sender-relative and receiver-relative timestamps are mutually exclusive calculations since the skew rate must be factored out of the latency calculation and the latency must be factored out of the skew rate calculation.

Therefore, in direct contrast with the method taught by Ravikanth, claim 1 is directed toward a method for determining a latency associated with a network. As shown above, network latency is not a clock skew rate. For at least these reasons, applicants submit that claim 1 is patentable over the prior art of record.

With regard to claims 2-18, these claims depend either directly or indirectly from claim 1. Applicants submit that claims 2-18 are also allowable for the additional patentable recitations included in these claims. For example, claim 7 recites the method of claim 1 further comprising normalizing the latency associated with each selected packet. The Office action contends that Ravikanth teaches the recitations of claim 7 in column 5, lines 15-35. Significantly, the cited and applied portion of Ravikanth instead teaches a method for normalizing the skew rate calculated between two computers. As shown above, latency and skew rate are different characteristics in a network. For at least this additional reason, claim 7 is patentable over Ravikanth.

Turning to the next independent claim, amended claim 19 recites a system for obtaining information transmitted over a network. The system comprises a network sender system that includes a sender process configured to cause transmission of a plurality of selected packets on the network and a sender component configured to associate a sender timestamp of the sender with each selected packet. The system further comprises a network receiver system configured to receive each selected packet transmitted on the network that includes a receiver component configured to associate a receiver timestamp with each selected packet received and a receiver process, the receiver process

determining a latency relative to the actual time between when each selected packet is sent and when each selected packet is received that is based on the sender timestamp and the receiver timestamp and maintaining information corresponding to the latency, the sender timestamp, and receiver timestamp in association with each selected packet.

The Office action rejected claim 19 by citing the same portions of Ravikanth that were cited in the rejection of claim 1. Applicants respectfully disagree with this rejection.

As shown above, latency and skew rate are different characteristics in a network. Ravikanth teaches, generally, a method for determining a skew rate between two computers. Significantly, Ravikanth does not teach or even suggest a receiver process that determines a latency based on a sender timestamp and a receiver timestamp as recited in claim 19. For at least this additional reason, claim 19 is patentable over Ravikanth.

With regard to claims 20-28, these claims depend either directly or indirectly from claim 19. Applicants further submit that claims 20-28 are also allowable for the additional patentable recitations included in these claims.

Turning to claims 29-38, the Office action has rejected these claims as being anticipated by Ravikanth The Office action contends that Ravikanth discloses a data structures having the recitations of claims 29-38. Applicants respectfully disagree.

As shown above, Ravikanth fails to disclose a system or a method for determining the latency of a network. Significantly, Ravikanth only teaches a

method for determining a skew rate. As such, Ravikanth does not teach or even suggest a data structure having fields operable to store data representative of a latency as recited in claim 29. Nor does Ravikanth teach a data structure having fields operable to store data representative of a send time and receive time suitable to determine a latency as recited in claim 35. Applicants submit that claims 28-39 are allowable over the teachings of Ravikanth.

Turning to claims 39-41, the Office action rejected these claims as being anticipated by Ravikanth and has cited the same portions of Ravikanth as cited in the rejection of claim 1 and has argued the same reasons presented in the rejection of claim 1. Claims 39-41 include the recitations of writing a sender-relative timestamp suitable to determine a latency into a second field, writing a receiver-relative timestamp suitable to determine a latency into a third field, and maintaining information corresponding to the sequence number, the sender-relative timestamp, and the receiver-relative timestamp, and the latency, the latency relative to the actual time between when each selected packet is sent and when each selected packet is received. In contrast to the recitations of claims 39-41, Ravikanth instead teaches, generally, a method for determining a skew rate between two computers. As shown above, latency and skew rate are different characteristics in a network. Ravikanth does not teach or even suggest the recitations of claims 39-41. For at least these additional reason, applicants submit that claims 39-41 are allowable.

For at least these additional reasons, applicants submit that all the claims are patentable over the prior art of record. Reconsideration and withdrawal of the

rejections in the Office Action is respectfully requested and early allowance of this application is earnestly solicited.

CONCLUSION

In view of the foregoing remarks, it is respectfully submitted that claims 1-41 are patentable over the prior art of record, and that the application is good and proper form for allowance. A favorable action on the part of the Examiner is earnestly solicited.

If in the opinion of the Examiner a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney at (425) 836-3030.

Respectfully submitted,

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